

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

ASSIGNEE: RIETER PERFOJET, Montbonnot, France

INVENTORS: Rosario MAGGIO, Laurent SCHMIT

SERIAL N°: 10/030,880

Filed: 20/04/2000

Title: Device for opening and distributing a bundle of filaments when producing a nonwoven textile web

Examiner: Joseph S. DEL SOLE

Docket N°: 34051

DECLARATION OF OLIVIER GUICHON

I, Olivier GUICHON, hereby declare as follows:

I am an employee of RIETER PERFOJET, Montbonnot, France, the assignee of the above cited application.

I am presently, and I have been for the past 4 years, a Project Manager in the R&D Division of Rieter Perfojet, especially for the development of the SPUNBOND technology.

I have studied the Final Office Action dated 13/08/2004 in the '880 application, and I am familiar with the prior art cited.

I have carried out the following **tests** :

The assembly representing the device for opening and distributing the bundle of filaments according to the above mentioned invention consists of a diffuser (assembly of a convergent zone and a **DIVERGENT ZONE**) associated with an **ELECTROSTATIC EQUIPMENT** that is charging the filaments before the filaments are received on the receiving belt. In the same time an external air flow is produced through two lateral slots adjacent to the device for opening and distributing the bundle of filaments by so-called "**VENTURI**" effect (an air flow induced by negative pressure).

TEST 1

The assembly representing the device for opening and distributing the bundle of filaments is **complete**, comprising all the elements of the device claimed in the above cited invention including the **DIVERGENT ZONE (DIV)**, the **ELECTROSTATIC EQUIPMENT (EE)**, and the "**VENTURI**" effect (V).

TEST 2

The assembly representing the device for opening and distributing the bundle of filaments is **not complete**, according our invention, comprising **DIV**, **V**, but **NOT the EE**.

TEST 3

The assembly representing the device for opening and distributing the bundle of filaments is **not complete**, according our invention, comprising **DIV**, **EE**, but **NOT the V**.

TEST 4

The assembly representing the device for opening and distributing the bundle of filaments is **not complete**, according our invention, comprising **V**, **EE**, but **NOT the DIV**.

The general settings of the assembly for all the TESTS 1, 2, 3 and 4 are the followings:

Polymer (raw material) : 99,85% Basell HP 561S and 0,15% TiO2 Clariant masterbatch

Line productivity : 700 kg/h

Conveyor speed: 161 m/min

Pressure in the draw unit: 0.6 bars

Weight of the web (determined by the productivity and the speed of the conveyor) 20 gsm (average).

Filaments titre (determined by the productivity and the pressure of the air injected in the draw unit): 1.9 dtex (average).

The settings of the elements determining our device have been adjusted as following:

| | TEST 1 | TEST 2 | TEST 3 | TEST 4 |
|-----|-----------------------------|-----------------------------|-----------------------------|-------------------------------------|
| EE | 40 mA / 30 kV | 0 mA / 0 kV | 40 mA / 30 kV | 40 mA / 30 kV |
| V | Slot free | Slot free | Slot clogged | Slot free |
| DIV | Inlet 10 mm Outlet 50 mm | Inlet 10 mm Outlet 50 mm | Inlet 10 mm Outlet 50 mm | Inlet 10 mm Outlet 10 mm |

All the other settings not mentioned allow the stabilisation of the production and are equal for all the tests.

RESULTS**1. Mechanical properties****Tensile Strength properties: MD / CD**

High tensile strength properties are required in the Machine Direction (MD) and also in Crosswise Direction (CD) for a wide range of applications. The tests have been done under EDANA test method ERT 20.2-89 (Tensile Strength).

| | TEST 1 | TEST 2 | TEST 3 | TEST 4 |
|------------|------------|------------|------------|------------|
| Average MD | 45 +/- 5 N | 26 +/- 5 N | 43 +/- 5 N | 24 +/- 5 N |
| Average CD | 25 +/- 5 N | 22 +/- 5 N | 22 +/- 5 N | 15 +/- 5 N |

2. Weight distribution

A narrow distribution of the weight is also required to guaranty a constant quality of the web. This property is determined by the Coefficient of Variation (Cv) as described in the EDANA test method ERT 40.3-90 (Mass Per Unit Area). The standard value in the spunbond technology is under 5%.

| | TEST 1 | TEST 2 | TEST 3 | TEST 4 |
|----------------|--------------|--------------|--------------|--------------|
| Average weight | 20,3 gsm | 20,65 gsm | 20,96 gsm | 20,40 gsm |
| Cv | less than 5% | less than 5% | more than 5% | less than 5% |

3. Evenness aspect properties

Uniformity of the web is crucial for many applications to get uniform properties, for instance air or liquid permeability.

We have classified the aspects of the webs into two major defects classes (for normal spunbond webs):

1. *holes or cloudiness* and
2. *married filaments*.

We have used a scale from 0 to 5 to classify the samples (**TEST1**, **TEST 2**, **TEST 3** and **TEST 4**) according to their visual qualities.

- 0 no defect, very good aspect, uniformity
5 the worst aspect, non-uniform.

The 4 samples attached are corresponding to the 4 **TESTS**.

| | TEST 1 | TEST 2 | TEST 3 | TEST 4 |
|--------------------|--------|--------|--------|--------|
| Holes / Cloudiness | 1 | 4 | 2 | 3 |
| Married filaments | 1 | 1 | 4 | 2 |

CONCLUSIONS

As we can see from the results of **TEST 2**, **TEST 3** and **TEST 4** as well as from the attached samples, the qualities: mechanical (MD and CD) as well as the uniformity of the corresponding final nonwoven products are not comparable with the quality of the final nonwoven product of **TEST 1** obtained with the complete assembly, according to our claimed device and including all the elements, the **DIVERGENT ZONE**, the **ELECTROSTATIC EQUIPMENT** and **VENTURI** effect. The web corresponding to **TEST 1** has the best results in terms of high tensile strength properties and of homogeneity with very good visual aspect.

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made herein on information and belief are believed to be true; and further, that these statements were made with the knowledge that wilful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such wilful false statements may jeopardize the validity of the application or any patent issued thereon.

Montbonnot, France

16.11.2004



OLIVIER GUICHON

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